Claims

We claim:

1. A DNA selected from the group consisting of:

(a) a DNA encoding a protein consisting of the amino acid sequence described in SEQ ID NO.: 2, and

(b) a DNA comprising the coding region of the base sequence described in SEQ ID NO.: 1.

2. A DNA encoding an Na+/H+ antiporter derived from monocotyledoneae selected from the group consisting of:

(a) a DNA encoding the protein consisting of the amino acid sequence described in SEQ ID NO.: 2, wherein one or more amino acids are substituted, deleted, inserted and/or added, and

(b) a DNA hybridizing under stringent conditions to the DNA consisting of the base sequence described in SEQ ID NO.: 1.

3. The DNA of claim 2, wherein the monocotyledoneae is a plant belonging to the *Gramineae* family.

4. A vector comprising DNA selected from the group consisting of:

(a) a DNA encoding a protein consisting of the amino acid sequence described in SEQ ID NO.: 2, and

(b) a DNA comprising the coding region of the base sequence described in SEQ ID NO.: 1.

5. A vector comprising DNA encoding an Na+/H+ antiporter derived from monocotyledoneae selected from the group consisting of:

(a) a DNA encoding the protein consisting of the amino

acid sequence described in SEQ ID NO.: 2, wherein one or more amino acids are substituted, deleted, inserted and/or added, and

(b) a DNA hybridizing under stringent conditions to the DNA consisting of the base sequence described in SEQ ID NO.: 1.

6. A transformant cell comprising DNA selected from the group consisting of:

(a) a DNA encoding a protein consisting of the amino acid sequence described in SEQ ID NO.: 2, and

(b) a DNA comprising the coding region of the base sequence described in SEQ ID NO.: 1.

7. The transformant cell of claim 7, wherein the cell is a plant cell.

8. A transformant cell comprising DNA encoding an Na+/H+ antiporter derived from monocotyledoneae selected from the group consisting of:

(a) a DNA encoding the protein consisting of the amino acid sequence described in SEQ ID NO.: 2, wherein one or more amino acids are substituted, deleted, inserted and/or added, and

(b) a DNA hybridizing under stringent conditions to the DNA consisting of the base sequence described in SEQ ID NO.: 1.

9. The transformant cell of claim 8, wherein the cell is a plant cell.

10. A protein encoded by a DNA selected from the group consisting of:

(a) a DNA encoding a protein consisting of the amino acid sequence described in SEQ ID NO.: 2, and

(b) a DNA comprising the coding region of the base sequence described in SEQ ID NO.: 1.

11. A protein encoded by a DNA encoding an Na+/H+ antiporter derived from monocotyledoneae selected from the group consisting of:

(a) a DNA encoding the protein consisting of the amino acid sequence described in SEQ ID NO.: 2, wherein one or more amino acids are substituted, deleted, inserted and/or added, and

(b) a DNA hybridizing under stringent conditions to the DNA consisting of the base sequence described in SEQ ID NO.: 1.

12. A method for production of a protein wherein said method comprises the steps of:

cultivating a transformant cell comprising DNA selected from the group consisting of:

(a) a DNA encoding a protein consisting of the amino acid sequence described in SEQ ID NO.: 2, and

(b) a DNA comprising the coding region of the base sequence described in SEQ ID NO.: 1;

and recovering the expressed protein from said cell or the supernatant of the culture thereof.

13. A method for production of a protein encoded by a DNA encoding an Na+/H+ antiporter derived from monocotyledoneae

wherein said method comprises the steps of:

cultivating a transformant cell comprising DNA encoding an Na+/H+ antiporter derived from monocotyledoneae selected from the group consisting of:

(a) a DNA encoding the protein consisting of the amino acid sequence described in SEQ ID NO.: 2, wherein one or more amino acids are substituted, deleted, inserted and/or added, and

(b) a DNA hybridizing under stringent conditions to the DNA consisting of the base sequence described in SEQ ID NO.: 1;

and recovering the expressed protein from said cell or the supernatant of the culture thereof.

14. A transformant plant comprising a transformant cell comprising DNA selected from the group consisting of:

(a) a DNA encoding a protein consisting of the amino acid sequence described in SEQ ID NO.: 2, and

(b) a DNA comprising the coding region of the base sequence described in SEQ ID NO.: 1.

15. The transformant plant of claim 14, wherein the plant is a monocotyledon.

16. The transformant plant of claim 15, wherein the plant belongs to the *Gramineae* family.

17. The transformant plant of claim 16, wherein the plant is rice.

18. A transformant plant that is the offspring or clone of a transformant plant comprising a transformant cell comprising DNA selected from the group consisting of:

(a) a DNA encoding a protein consisting of the amino acid sequence described in SEQ ID NO.: 2, and

(b) a DNA comprising the coding region of the base sequence described in SEQ ID NO.: 1.

19. A transformant plant comprising a transformant cell comprising DNA encoding an Na+/H+ antiporter derived from monocotyledoneae selected from the group consisting of:

(a) a DNA encoding the protein consisting of the amino acid sequence described in SEQ ID NO.: 2, wherein one or more amino acids are substituted, deleted, inserted and/or added, and

(b) a DNA hybridizing under stringent conditions to the DNA consisting of the base sequence described in SEQ ID NO.: 1.

20. The transformant plant of claim 19, wherein the plant is a monocotyledon.

21. The transformant plant of claim 20, wherein the plant belongs to the *Gramineae* family.

22. The transformant plant of claim 21, wherein the plant is rice.

23. A transformant plant that is the offspring or clone of a transformant plant comprising a transformant cell comprising DNA encoding an Na+/H+ antiporter derived from monocotyledoneae selected from the group consisting of:

(a) a DNA encoding the protein consisting of the amino acid sequence described in SEQ ID NO.: 2, wherein one or more amino acids are substituted, deleted, inserted and/or added, and

(b) a DNA hybridizing under stringent conditions to the DNA consisting of the base sequence described in SEQ ID NO.: 1.

24. A material for the breeding of a transformant plant comprising a transformant cell comprising DNA selected from the group consisting of:

(a) a DNA encoding a protein consisting of the amino acid sequence described in SEQ ID NO.: 2, and

(b) a DNA comprising the coding region of the base sequence described in SEQ ID NO.: 1.

25. A material for the breeding of a transformant plant comprising a transformant cell comprising DNA encoding an Na+/H+ antiporter derived from monocotyledoneae selected from the group consisting of:

(a) a DNA encoding the protein consisting of the amino acid sequence described in SEQ ID NO.: 2, wherein one or more amino acids are substituted, deleted, inserted and/or added, and

(b) a DNA hybridizing under stringent conditions to the DNA consisting of the base sequence described in SEQ ID NO.: 1.

26. An antibody that binds to a protein wherein said protein is encoded by a DNA selected from the group consisting of:

(a) a DNA encoding a protein consisting of the amino acid sequence described in SEQ ID NO.: 2, and

(b) a DNA comprising the coding region of the base sequence described in SEQ ID NO.: 1.

27. An antibody that binds to a protein wherein said protein is encoded by a DNA encoding an Na+/H+ antiporter derived from monocotyledoneae selected from the group consisting of:

(a) a DNA encoding the protein consisting of the amino acid sequence described in SEQ ID NO.: 2, wherein one or more

amino acids are substituted, deleted, inserted and/or added, and

(b) a DNA hybridizing under stringent conditions to the DNA consisting of the base sequence described in SEQ ID NO.: 1.

28. A nucleic acid molecule that hybridzes with the DNA described in SEQ ID NO: 1, and which has a chain length of at least 15 nucleotides.